

## CLAIMS

1. A fuel cell compression assembly, comprising:  
a carriage unit having at least two opposing side walls maintained in  
5 spaced relation by a base member extending therebetween at a lower  
position on the sides,  
the opposing side walls and base member thereby defining a cradle  
for receiving fuel cell plates,  
the opposing side walls each including at least one engagement  
10 member on internal face for engaging with a top member forming the top of  
the carriage unit.
2. The fuel cell compression assembly of claim 1 wherein each of the  
sides includes a plurality of corresponding engagement members spaced at  
15 intervals down the side walls.
3. The fuel cell compression assembly of claim 2 wherein the  
engagement members each comprise teeth projecting inwardly towards the  
internal volume of the carriage unit.  
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4. The fuel cell compression assembly of claim 3 in which each of the  
teeth has an asymmetric profile allowing passage of the top member  
thereover in a first direction, but not in a second direction opposite to the  
first direction.  
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5. The fuel cell compression assembly of any preceding claim in which  
the side walls are formed of a material having sufficient resilience to allow a  
top member to be engaged with the carriage unit by passage over and  
temporary displacement of a relevant engagement member.

6. The fuel cell compression assembly of claim 2 in which the engagement members comprise parallel ribs extending along a substantial lateral extent of the side walls.
- 5 7. The fuel cell compression assembly of claim 6 in which each of the ribs has an asymmetric profile allowing passage of the top member thereover in a first direction, but, not in a second direction opposite to the first direction.
- 10 8. The fuel cell compression assembly of claim 7 in which each of the ribs has a profile allowing disengagement of the top member in a direction parallel to the axes of the ribs.
9. The fuel cell compression assembly of claim 1 in which each of the  
15 side walls includes ventilation apertures therein.
10. The fuel cell compression assembly of claim 4 or claim 7 in which the direction of engagement of the top member to the side walls is perpendicular to the plane of the base member.
- 20 11. The fuel cell compression assembly of any preceding claim in which the top member includes at least two corresponding engagement members for engaging with each of the engagement members on respective side walls of the carriage unit.
- 25 12. The fuel cell compression assembly of any preceding claim in which the engagement members are situated in recesses in the respective side wall.
13. The fuel cell compression assembly of claim 12 in which the top  
30 member is adapted to be received into the recesses in the side walls.

14. The fuel cell compression assembly of any preceding claim in which the carriage unit is formed from aluminium.
- 5 15. The fuel cell compression assembly of any preceding claim in which the base member and/or top member are formed as a box-section aluminium extrusion.
- 10 16. The fuel cell compression assembly of any preceding claim further including location features situated on external walls thereof for the provision of fuel tanks or other system hardware.
17. A fuel cell compression assembly comprising:  
a carriage unit cradle for receiving a stack of fuel cell plates and for  
15 maintaining the plates in substantially overlying relationship; and  
a closure member adapted to close the carriage unit and apply pressure to the plates therein, by automatic locking engagement with the cradle when the closure member is brought into position with the cradle in a first direction substantially orthogonal to the plane of the plates.
- 20 18. The fuel cell compression assembly of claim 17 in which return of the closure member in a second direction opposite to the first direction is prevented by interlocking teeth provided in the cradle and in the closure member.
- 25 19. The fuel cell compression assembly of claim 18 in which the interlocking teeth provide a plurality of automatic locking positions sequentially at varying distances along the first direction.
- 30 20. A method of forming a fuel cell stack comprising the steps of:

providing a carriage unit cradle for receiving a plurality of fuel cell plates into a confinement volume therein;

installing said fuel cell plates into the cradle to form a stack;

5 applying a carriage unit closure member to compress the fuel cell plates in a first direction substantially orthogonal to the plane of the plates and to engage the closure member with the cradle;

the carriage unit providing automatic locking engagement of the closure member and the cradle when the closure member has reached an appropriate degree of compression of the plates.

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21. The method of claim 20 further including the step of passing through a series of successive automatic locking engagement positions between the closure member and the cradle intermediate the starting position and the final position at which the closure member has reached an appropriate  
15 degree of compression of the plates.

22. Apparatus substantially as described herein with reference to the accompanying drawings.

20 23. A method of forming a fuel cell stack substantially as described herein with reference to the accompanying drawings.